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(54) ORGANIC ELECTROLUMINESCENCE PANEL FOR TWO SIDE DISPLAY, FOLDER TYPE MOBILE STATION USING THE PANEL AND DISPLAY METHOD OF THE MOBILE STATION

Abstract

Machine Translation

Human Translation

- 1 The present invention is to provide the folder type mobile terminal and the of which display method using the organic EL panel for both side display, and the panel, and as to the folder type mobile terminal display methc using the organic EL panel for both side display, upper and lower part substrate are formed with the transparent substrate. It includes one organic EL panel in which the radiation of the organic light-emitting lay. formed between upper and lower part substrate occurs due to a bidirectional and which is indicated. It receives the step: step: driving control signal receiving the sensing signal and outputs the organic EL panel driving control signal and detects the opening of the folder of the mobile terminal and OFF, outputs a signal i a folder is the open state, it scans the whole of the organic EL panel and it approves data in the scanned pixi and it operates the whole panel. The whole is comprised of the step scanning a part of the organic EL panel a folder is OFF and approves data in the scanned pixel and operates the panel a part. It holds the rising of th unit cost of the terminal back because both side display of the mobile terminal for a folder is possible throug one organic EL panel. The display having the structure of being simple is possible.

Representative Drawing(s)

Fig. 2

Keyword(s)

EL(electroluminescence)

Description

▶ **Brief explanation of the drawing**

- 2 Fig. 1 is a structure sectional diagram of the conventional organic EL panel.
- 3 Fig. 2 is a structure sectional diagram of the organic EL panel for both side display.
- 4 Fig. 3 is a block diagram of the folder type mobile terminal using the organic EL panel for both side display.
- 5 Fig. 4 is an example of case, a folder is the open state of the folder type mobile terminal.
- 6 Fig. 5 is an example of case, a folder is OFF of the folder type mobile terminal.
- 7 Fig. 6 is a flow chart of the mobile terminal display method for the folder using the organic EL panel for both side display.
- 8 * The description of reference numerals of the main elements in drawings.
- 9 11: lower transparent substrate 12: first electrode.
- 10 14: second electrode 13: organic light-emitting layer.
- 11 15: inorganic material 16: upper transparent substrate.
- 12 17: sealant.
- 13 10: controller 20: key input unit.
- 14 30: driving part 31: scan drive IC.
- 15 32: data driven IC 40: organic EL panel.
- 16 50: RF part 60: sensor.

▶ **Details of the Invention**

▶ **Purpose of the Invention**

The Technical Field to which the Invention Belongs and the Prior Art in that Field

- 17 The present invention relates to the organic EL panel for both side display which it mounts to the folder type mobile terminal and the of which display method using the organic EL panel.
- 18 In these days cellular phone, products which become in the form of a folder are very much brought. The product employing the phosphorus side and LCD having the respective other size on an outside of the display panel is much produced.
- 19 In case of employing such LCD, the size which is bigger than the LCD panel for the display of an outside is used. LCD panel for the display of an inside.
- 20 But there can be the disadvantageous problem of being many in the unit cost the number of part which has to be used and which is moreover used increase to a twice as the respective other form this as to this kind of a form, the display panel is a cranium.

- 21 The organic EL panel will be able to be introduced to the display panel as described above.
- 22 As shown in Fig. 1, in the structure of the conventional organic EL panel, by the ITO (Indium Tin Oxide) which transparent material on the transparent substrate (1) being etched and patterning the first electrode (2) is formed, the organic light-emitting layer (3) is deposited on the upper part. The second electrode (4) is formed by using the upper part. By using the metal plate (5) for the upper part, it consists of the structure of sealing with the (6). In this structure, it consists of the structure where the light comes towards the transparent substrate (1).

Technical challenges of the invention

- 23 Therefore, the present invention is devised to solve the above described problems, and the first and the second electrode are altogether used as the transparency metal. By sealing by using the transparent substrate the organic EL panel in which both side display is possible is provided but it has the purpose.
- 24 Another object of the present invention is that by using one organic EL panel for both side display, in case of the open state, the whole is indicated. In case of being OFF the part is represented and the mobile terminal for the display method in which the recognition becomes all possible is provided to an inside and outside of the mobile terminal but a folder has the purpose.

► Structure & Operation of the Invention

- 25 The feature of the organic EL panel for both side display according to the present invention for achieving the above described object is evaporated in the pixel defined with a cross-domain between the first electrode: second electrode. The first electrode is formed and the second electrode forms the transparent electrode material on the lower transparent substrate. The pixel is comprised of the upper transparent substrate sealing the organic light-emitting layer: first electrode, radiating with the voltage applied in the first and the second electrode the organic light-emitting layer, and the second electrode.
- 26 The feature of the folder type mobile terminal using the organic EL panel for both side display according to the present invention for achieving the above described object modulates the inputted speech signal into the radio signal. The upper and lower part substrate are formed at the mobile terminal for the folder equipped with the RF part modulating the radio signal received through an antenna and outputs into the transparent substrate. It is comprised of the key unit equipped with a plurality of function keys performing a plurality of numeric keys for one organic EL panel controller: driving part: dialing receiving the organic EL panel driving control signal from a controller and operating the organic EL panel and the special function receives the sensing signal from a sensor and outputs the organic EL panel driving control signal detects the opening of the folder of the mobile terminal and OFF, outputs a signal in which the radiation of the organic light-emitting layer formed between upper and lower part substrate occurs due to a bidirectional and which is indicated.
- 27 The sensing signal is input from a sensor and if a folder is the open state, it indicates the whole of the organic EL panel. In order to represent a part of the organic EL panel if a folder is OFF a controller outputs the organic EL panel driving control signal.
- 28 If a folder is the open state, it scans the whole of the organic EL panel and it approves data in the scanned pixel. If a folder is OFF, it scans a part of the organic EL panel and it approves data in the scanned pixel and the driving part operates the panel a part.
- 29 And data of the panel displayed on the open state a folder is OFF is approved in the pixel scanned with the pixel. The data display direction is diversified and it indicates.

- 30 The feature of the folder type mobile terminal display method using the organic EL panel for both side display according to the present invention for achieving the above described object modulates the inputted speech signal and the radio signal. The RF part modulating the radio signal received through an antenna and outputs is included and upper and lower part substrate are formed with the transparent substrate. It is comprised of the mobile terminal display method for the folder equipped with one organic EL panel in which the radiation of the organic light-emitting layer is formed between upper and lower part substrate occurs due to a bidirectional and which is indicated according to the step: step: step: drive receiving the organic EL panel driving control signal and operates the organic EL panel in the step indicating each pixel of the organic EL panel. Receives the sensing signal of the mobile terminal and the organic EL panel driving control signal detects the opening of the folder of the mobile terminal and OFF, outputs a signal.
- 31 The driving stage is made that it performs the step: step scanning a part of the organic EL panel if a folder is in the closed state and approves data in the scanned pixel and operates the panel a part scans the whole of the organic EL panel if in the open state and approves data in the scanned pixel and operates the whole panel.
- 32 Another object of the present invention, and a characteristic and advantages will become clear through the detailed description of the embodiment referring to the drawing attached.
- 33 It is the same as that of the next time referring to the figure, if it illustrates for the preferred embodiment of the method and the folder type mobile terminal using the organic EL panel for both side display it attaches.
- 34 Fig. 2 is evaporated in the pixel defined with a cross-domain between the second electrode (14), and the first and second electrodes (12, 14). In order to intersect with the first electrode (12) by using the first electrode (12), which is formed by etching the ITO (Indium Tin Oxide) which is the transparency metal on the lower transparent substrate and patterning, and transparency metal it patterns and the organic EL panel (40) is comprised of the structure shown in the sectional diagram of the organic EL panel (40) for both side display including the organic light-emitting layer (13) which is radiating with the voltage applied in the first and second electrodes (12, 14) and the upper transparent substrate (16) which is with the inorganic arc layer (14), first electrode (12), organic light-emitting layer (13), second electrode (14) which is formed in order to cover the organic light-emitting layer (13) sealed with the sealant (17).
- 35 In the structure of this organic EL panel (40), the light comes to the upper transparent substrate (16) and lower transparent substrate (11) both sides everywhere.
- 36 Fig. 3 is a block diagram of the folder type mobile terminal using the organic EL panel (40) for both side display.
- 37 Referring to Fig. 3, the folder type mobile terminal is comprised of the RF part (50), with the organic EL panel (40), the sensor (60), with the controller (10), driving part (30), key input unit (20).
- 38 As to the organic EL panel (40), upper and lower part substrate are formed with the transparent substrate. The radiation of the organic light-emitting layer formed in the pixel region between upper and lower part substrate occurs due to a bidirectional and it is indicated.
- 39 The sensor (60) detects the opening of the folder of the mobile terminal and OFF, it outputs a signal.
- 40 The controller (10) controls the overall operation of the mobile terminal. And it receives the sensing signal from the sensor (60) and it outputs the organic EL panel (40) driving control signal.
- 41 The driving part (30) receives the organic EL panel (40) driving control signal of the controller (10) and in order to operate the operation state or dialing data of the mobile terminal indicated on the organic EL panel (40) it operates the operation state or dialing data of the mobile terminal.

- 42 The key input unit (20) provides a plurality of function keys performing a plurality of numeric keys for a dialing special function.
- 43 The RF part (50) is controlled with the controller (10). And it alters the inputted speech signal into the radio signal, modulates the radio signal received through an antenna and it outputs.
- 44 The driving part (30) is comprised of the scan drive IC (31), authorizing the scan signal for turning a pixel on and a driving integrated circuit (32) approving data in the pixel turned on with the scan drive IC (31).
- 45 And as to the controller (10), the sensing signal is input from the sensor (60) and if a folder is the open state, it indicates the whole of the organic EL panel (40). In order to represent a part of the organic EL panel (40) if a folder is OFF it outputs the organic EL panel (40) driving control signal and it authorizes in the driving part (30).
- 46 The driving part (30) receives the driving control signal from the controller (10) and if a folder is the open state, it scans the whole of the organic EL panel (40) to the forward direction and it approves data in the scanned pixel and it operates the organic EL panel (40) whole. If a folder is OFF, it scans a part of the organic EL panel (40) and it approves data in the scanned pixel and it operates the organic EL panel (40) a part.
- 47 And data of the organic EL panel (40) displayed on the open state a folder is OFF is approved in the pixel scanned with the part and data display direction is diversified and it indicates.
- 48 Therefore, the driving part (30) receives the driving control signal and if a folder is the open state, it scans the whole of the organic EL panel (40) to the forward direction with the scan drive IC (31) and it approves data in the scanned pixel with data driving integrated circuit (32) and it operates the organic EL panel (40) whole.
- 49 And as to the driving part (30), if a folder is OFF, it scans a part of the organic EL panel (40) with the scan drive IC (31) and it approves data in the scanned pixel with data driving integrated circuit (32) and it operates the organic EL panel (40) a part.
- 50 That is, in the organic EL panel (40), the light coming in every direction the whole is indicated in the inside of the panel and the wide screen is looked at. In case in case a folder was closed, the part was represented and it looked at a narrow part and a folder was closed, the consumption of the power at the whole organic EL panel (40) is minimized.
- 51 Fig. 4 is a drawing of an example of case, a folder is the open state of the folder type mobile terminal, the display area indicated with the organic EL panel (40) is divided into the icon part (A), and data part (B).
- 52 Fig. 5 is a drawing of an example of case, a folder is OFF of the folder type mobile terminal, as shown in Fig. 4, a portion (B') of the icon part (A), indicated by the organic EL panel (40) of the open state and data part was indicated.
- 53 As described above, the driving part (30) scans a part of the organic EL panel (40) corresponding to the heat of the folder indicating if a folder is OFF. It can tell. Diversifies the direction of indicated data and desires.
- 54 And data of the panel displayed on the open state the sensing signal is input from the sensor (60) is approved in the pixel scanned with the part and data display direction is diversified.
- 55 Fig. 6 shows the flow chart of the mobile terminal display method for the folder using the organic EL panel (40) side display.
- 56 Firstly, the step that determines whether the power source of the mobile terminal was turned on or not is performed.

The step that judges OFF of a folder by it detects the opening of the folder of the mobile terminal and OFF, if it is on, outputting a signal from a sensor, is performed (S100) (S200).

- 57 The sensing signal of the mobile terminal is received and the driving control signal of one organic EL panel (40) is outputted. The step receiving the organic EL panel (40) driving control signal and it scans the whole of the organic EL panel (40) if a folder is the open state and approves data in scanned pixel and operates the whole panel is performed (S300).
- 58 The step approving data of the panel displayed on the open state a folder is OFF in the pixel scanned with the data diversifies data display direction is performed. The step approving data in the partly scanned pixel and operating the panel a part is performed (S400) (S500).
- 59 According to the whole and part drive, the step (S600) indicating each pixel of the organic EL panel (40) is performed.

▶ Effects of the Invention

- 60 The effect as follows has the organic EL panel for both side display according to the present invention described above, and the folder type mobile terminal and the display method using the panel.
- 61 The first and the second electrode are altogether used as the transparency metal. By sealing by using the transparent substrate both side display is possible through one organic EL panel.
- 62 By using one organic EL panel for both side display, in case a folder is the open state, the whole is indicated. If being OFF the part is represented and the mobile terminal for the folder in which the recognition becomes possible in an inside and outside of a folder can be manufactured and the rising of the unit cost of the terminal is back. The display having the structure of being simple is possible.
- 63 As illustrated in the above, it will be able to know at the range that does not break away from the technical spirit of the present invention if it is the person skilled in the art that a change and the various correction are possible.
- 64 Therefore, the technical scope of the present invention is not restricted to the content that is written in the embodiment but it determines by the range of the patent claim.

☉ Scope of Claims

Claim[1] :

- 65 The organic EL panel for both side display wherein it is evaporated in the pixel defined with a cross-domain by the first electrode: second electrode: first which patterns in order to form the transparent electrode material and intersects with the first electrode and is formed and the second electrode forms the transparent electrode material on the lower transparent substrate and patterns and is formed; and the pixel is comprised of the upper transparent substrate: scan drive IC: scan drive IC authorizing the scan signal for turning a pixel on including data driving integrated circuit approving data in the pixel turned on. Seals the organic light-emitting layer: first electrode, second electrode with the voltage applied in the first and the second electrode the organic light-emitting layer, and the second electrode.

Claim[2] :

- 71 The organic EL panel for both side display of claim 1, wherein the inorganic material is more formed on the organic light-emitting layer.

Claim[3] :

- 72 The folder type mobile terminal using the organic EL panel for both side display wherein the inputted speech

altered into the radio signal; upper and lower part substrate are formed at the mobile terminal for the folder equipped with the RF part modulating the radio signal received through an antenna and outputs into the transparent substrate and it is comprised of the key input unit equipped with a plurality of function keys performing a plurality of functions for one organic EL panel: sensor controller: driving part: dialing receiving the organic EL panel driving control signal from a controller and operates the organic EL panel and the special function receives the sensing signal from a sensor and outputs the organic EL panel driving control signal detects the opening of the folder of the mobile terminal and OFF, outputs a signal in which the radiation of the organic light-emitting layer formed between upper and lower part substrate occurs due to a bidirectional current and which is indicated.

Claim[4] :

- 78 The folder type mobile terminal using the organic EL panel for both side display of claim 3, wherein in a control stage a sensing signal is input from a sensor and it indicates the whole of the organic EL panel if a folder is the open state and it outputs the organic EL panel driving control signal in order to represent a part of the organic EL panel if a folder is OFF.

Claim[5] :

- 80 The folder type mobile terminal using the organic EL panel for both side display of claim 3, wherein in the driving stage it scans the whole of the organic EL panel if a folder is the open state and it approves data in the scanned pixel and operates the whole panel; and it scans a part of the organic EL panel if a folder is OFF and it approves data in the scanned pixel and it operates the panel a part.

Claim[6] :

- 83 The folder type mobile terminal using the organic EL panel for both side display of claim 5, wherein the driving stage approves data of the panel displayed on the open state a folder is OFF in the pixel scanned with the part and diversifies and indicates data display direction.

Claim[7] :

- 85 The folder type mobile terminal display method that uses the organic EL panel for both side display, folder type mobile terminal display method comprising: the step: step: step: step indicating each pixel of the organic EL panel according to a drive stage operates the organic EL panel it receives the organic EL panel driving control signal outputs the organic EL panel driving control signal it receives the sensing signal of the mobile terminal outputs a signal it detects the opening of the folder of the mobile terminal and OFF in the mobile terminal display method for the folder equipped with organic EL panel which is indicated the radiation of the organic light-emitting layer formed between upper and lower part substrate occurs due to a bidirectional current upper and lower part substrate are formed into the transparent substrate includes the RF part who outputs it modulates the radio signal received through an antenna it alters the input speech signal into the radio signal.

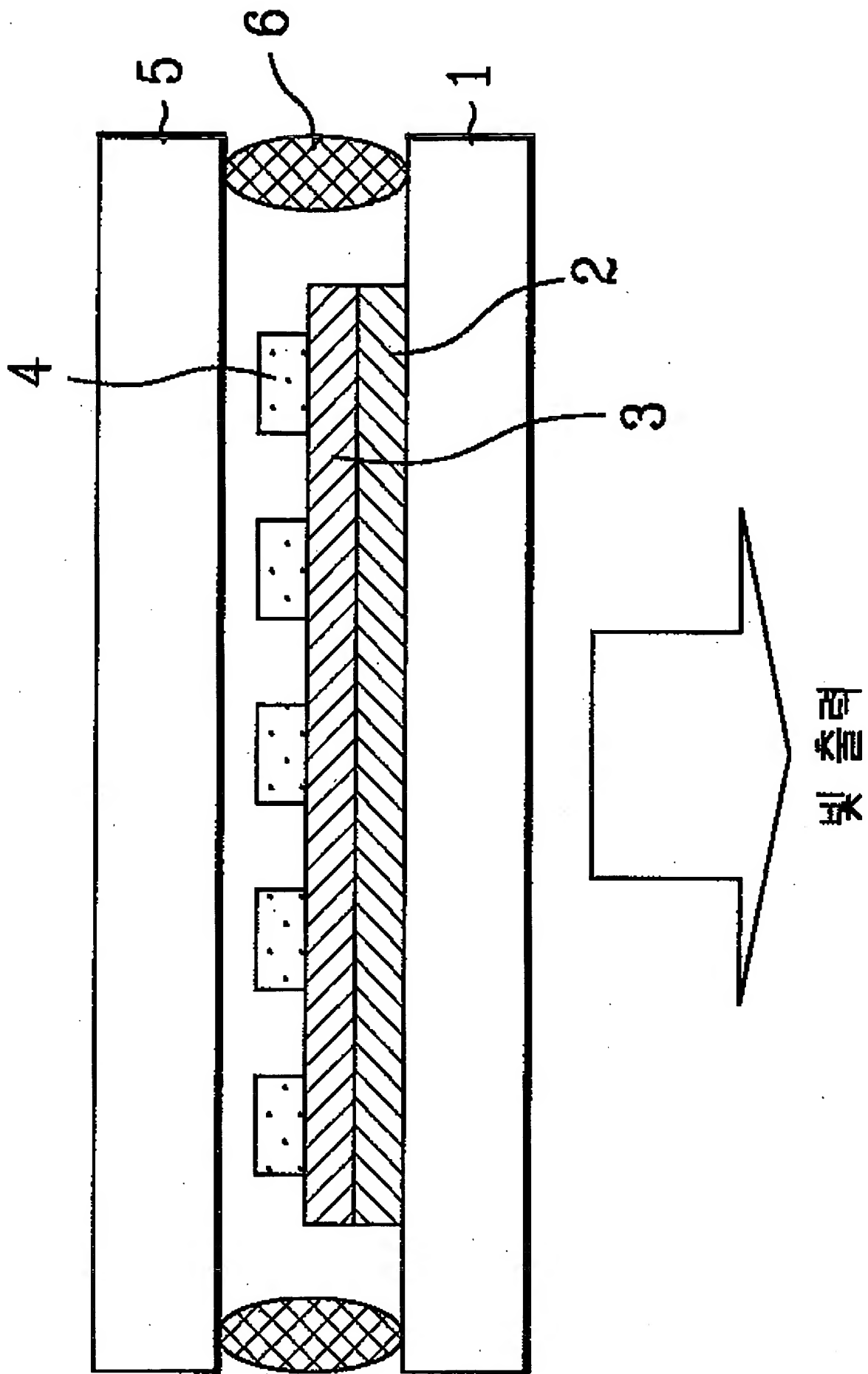
Claim[8] :

- 90 The folder type mobile terminal display method using the organic EL panel for both side display of claim 7, wherein the driving stage performs the step: step scanning a part of the organic EL panel if a folder is OFF and approves the scanned pixel and operates the panel a part scans the whole of the organic EL panel if a folder is the open state and approves data in the scanned pixel and operates the whole panel.

Claim[9] :

- 93 The folder type mobile terminal display method using the organic EL panel for both side display of claim 8, wherein the driving stage approves data of the panel displayed on the open state a folder is OFF in the pixel scanned with the part and it diversifies and indicates data display direction.

Figure 1



甜
水
五



Figure 3

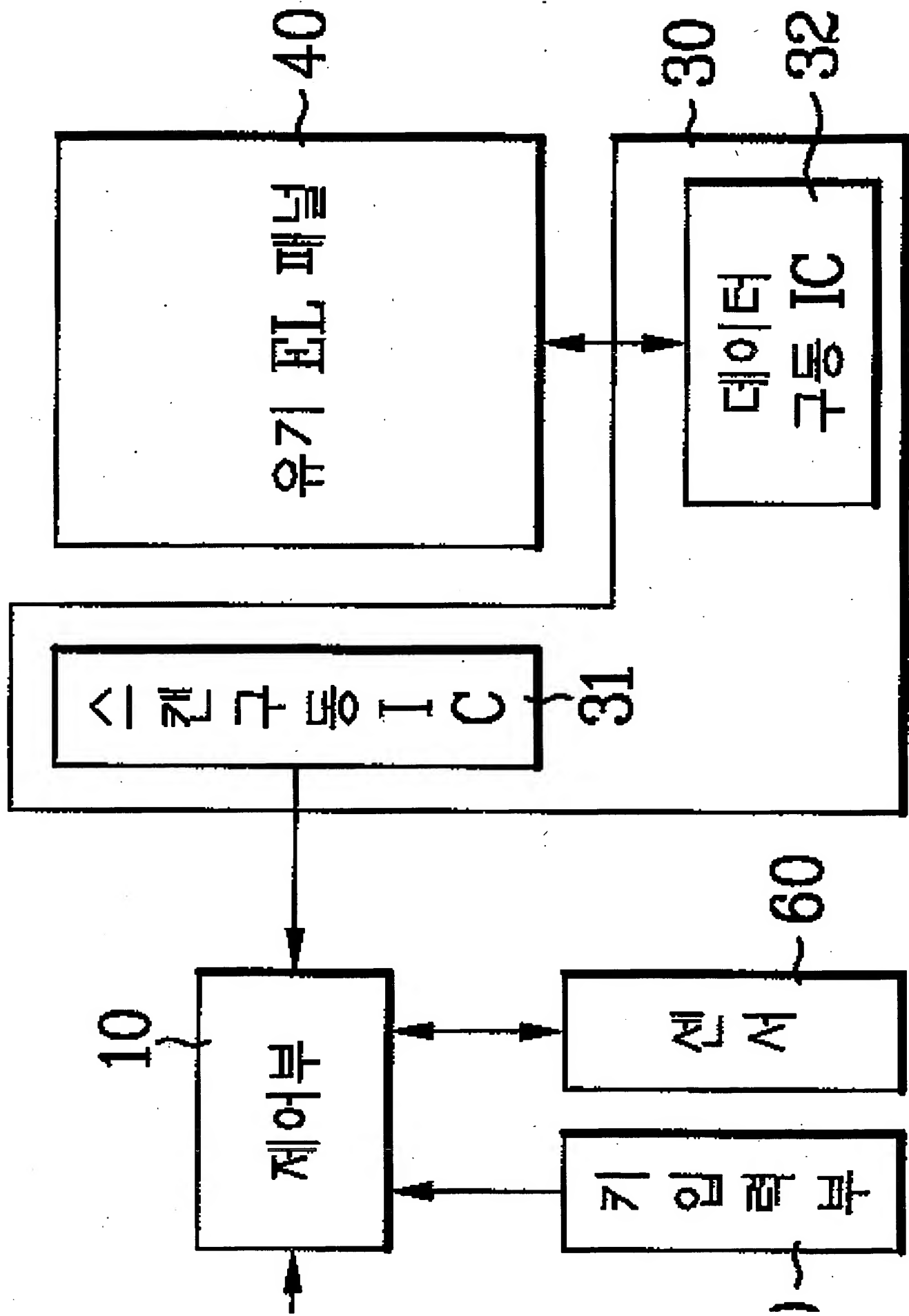


Figure 3

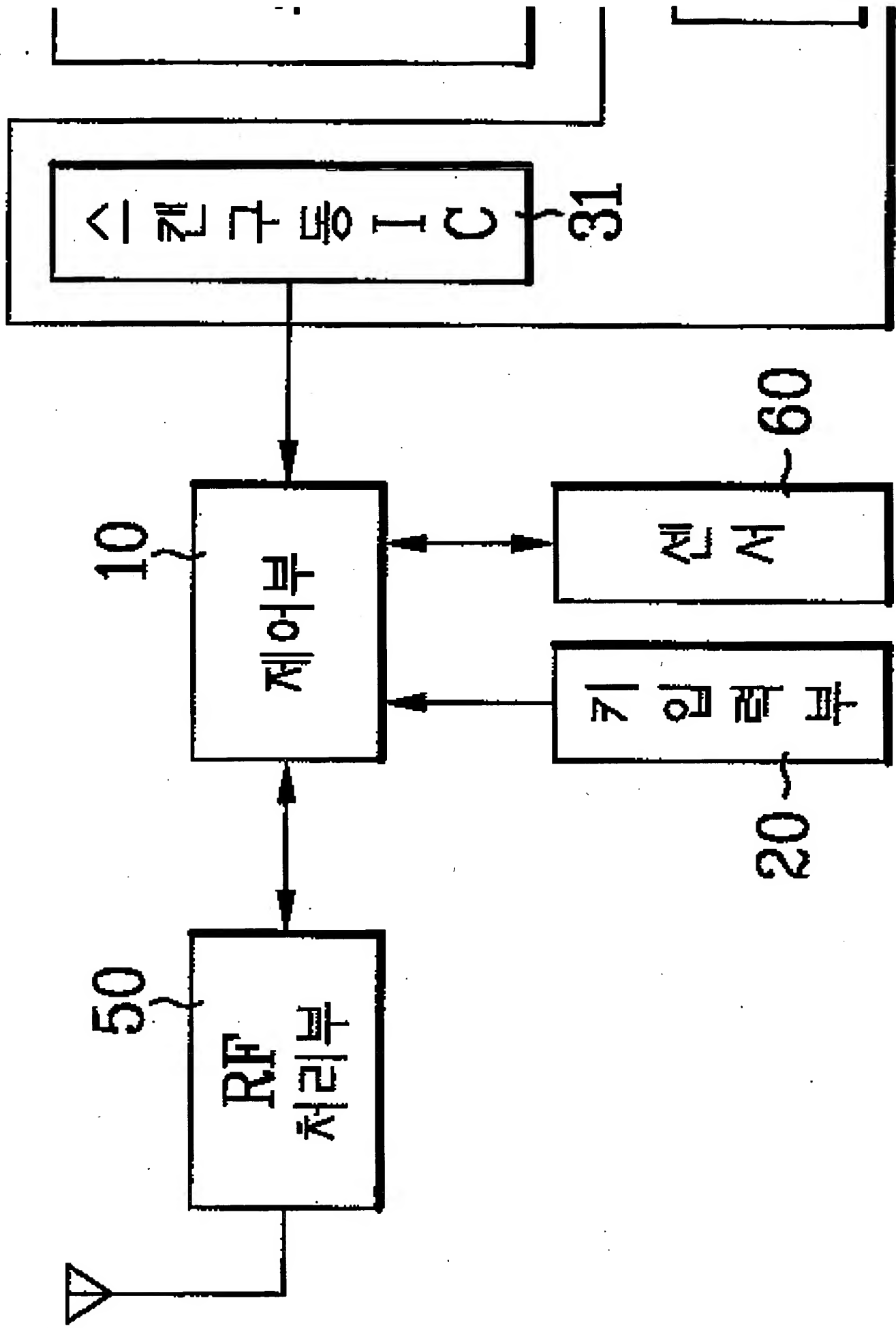


FIGURE 4

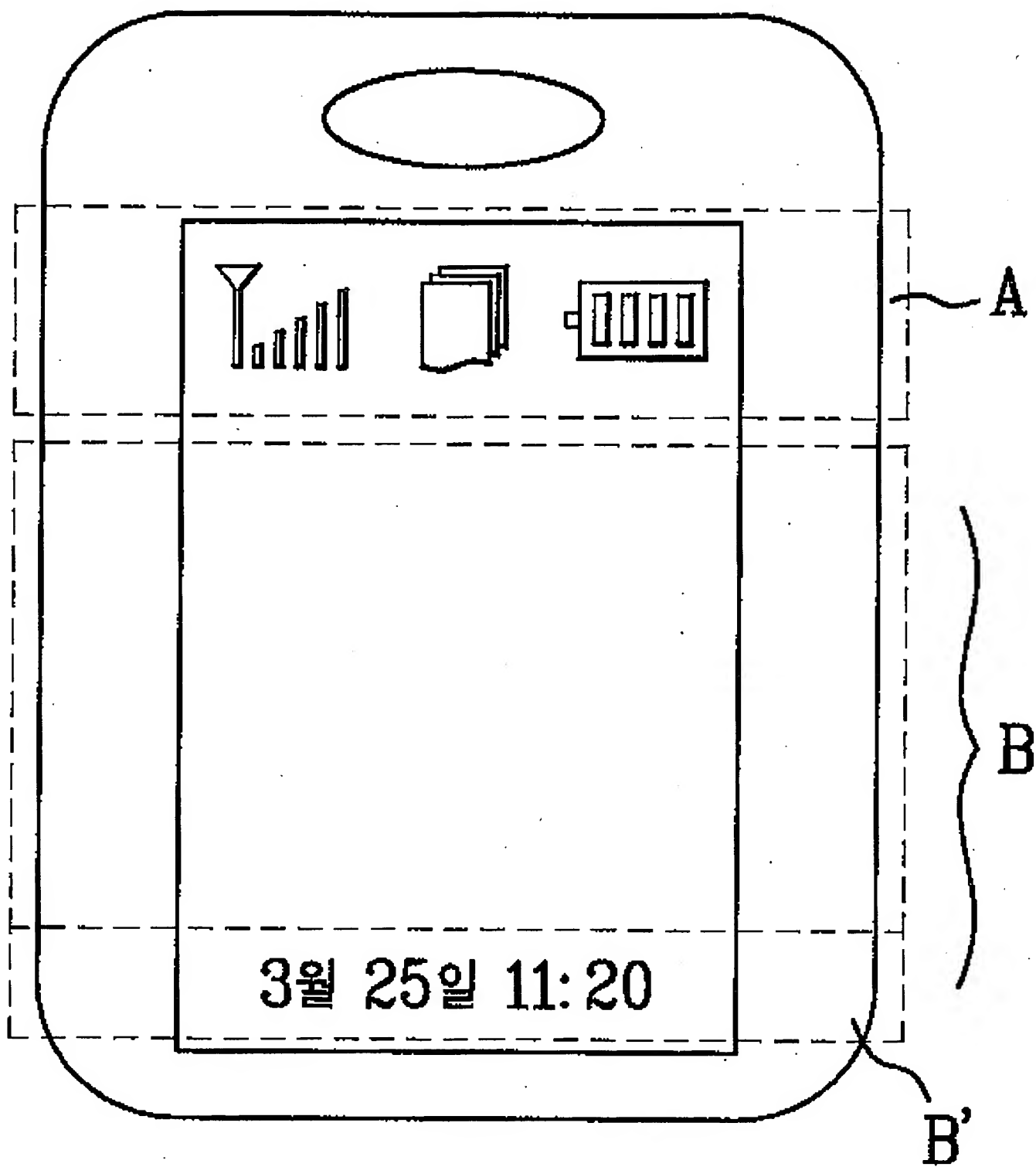


FIGURE 5

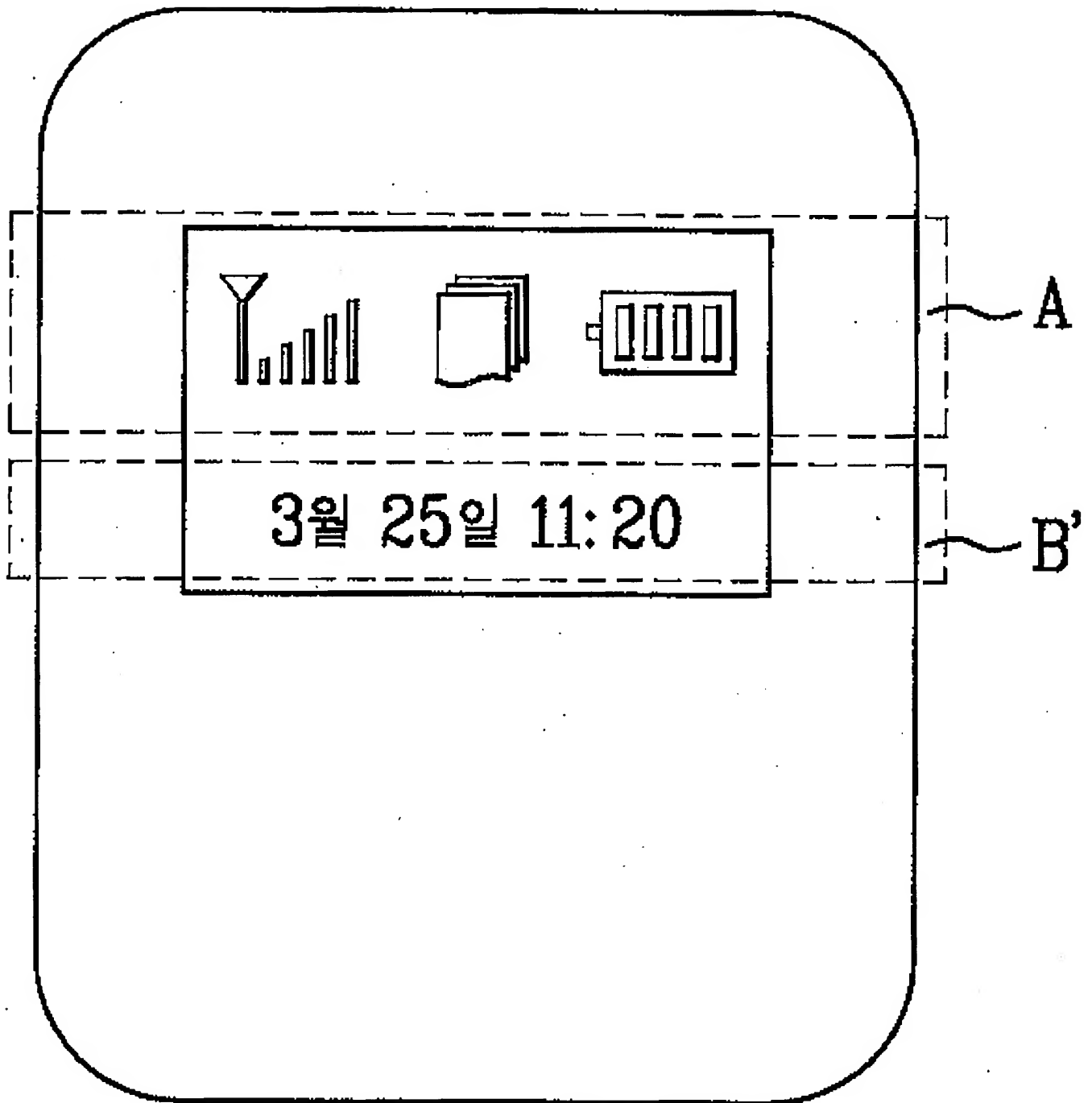


FIGURE 6

